



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/673,271	11/28/2000	Ernst Eberlein	40999	3541
7590	08/24/2004			EXAMINER
John E Holmes Roylance Abrams Berdo & Goodman Suite 600 1300 19th Street NW Washington, DC 20036			BAYARD, EMMANUEL	
			ART UNIT	PAPER NUMBER
			2631	10
DATE MAILED: 08/24/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/673,271	EBERLEIN ET AL.
	Examiner	Art Unit
	Emmanuel Bayard	2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 04 June 2004.

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

4)  Claim(s) 47-92 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 47-92 is/are rejected.  
7)  Claim(s) \_\_\_\_\_ is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5.7.  
4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_\_

**DETAILED ACTION**

1. This is in response to amendment filed 6/4/04 in which claims 47-92 are pending. The applicant's amendments have been fully considered therefore but they are moot based on the new ground of rejection. Therefore this case is made final.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 47-92 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 47, 50, 55, 61, 70, 73, 78 and 84 recite the limitation "in the time domain" in lines 8, 17, 8, 8, 9, 18, 8 and 9, respectively. There is insufficient antecedent basis for this limitation in the claim.

5. Claims 46-49, 51-54, 56-60, 62-69, 71-72, 74-77, 79-83 and 85-92 are likewise rejected because they depend on a based rejected claim.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 47-54, 70-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al U.S. patent No 5,694,389 in view of Seki U.S. Patent No 5,771,224 and in further view of Aslanis et al U.S. patent No 6,359,933 B1.

As per claims 47, 50, 70, 73, Seki et al discloses a method for generating a multi-carrier modulated signal having a frame structure, each frame of said frame structure comprising at least one useful symbol, a guard interval associated to said at least one useful symbol and a reference symbol, said method comprising the steps of: OFDM carriers symbol or QAM or QPSK symbols are considered as the claimed (providing a bit stream) (see abstract and figs. 1-4 and col.4 lines 20-45, 60-67 and col.51-10, lines 20-30); mapping (see figs. 4, 15, 17 elements 203, 1303 and col.5, line 48 and col.11, line 65) bits of said bit stream to carriers in order to provide a sequence of spectra; performing an inverse Fourier transform (see figs. 4, 15, 17 element 208 and col.5, lines 29-30,63-67, in order to provide multi-carrier modulated symbols); associating a guard interval (see figs. 4, 15, 17 element 209 and col.5, lines 65-67 and col.6, lines 1-3) to each multi-carrier modulated symbol; generating said reference symbol (see fig.4 elements 206, 1102, 1305 and col.5, line 55) by performing an amplitude modulation of a bit sequence, the envelope of the amplitude modulated (see col.5, lines 49-55) bit sequence defining the reference pattern of said reference symbol; associating said reference symbol to a predetermined number of multi-carrier modulated symbols (see col.5, lines 50-67) and associated guard intervals in order to define said frame (see fig.7 and col.4, lines 15-25 and col.5, lines 65-67 and col.6, lines 1-3).

However Seki "389" does teach inserting said amplitude modulated bit sequence into said signal as said reference symbol.

Seki "224" teaches inserting said amplitude modulated bit sequence into said signal as said reference symbol (see col.2, lines 10-40).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Seki into Seki as to correct the transmission frame according to the detected variations in amplitude and phase of the received signal as taught by Seki "224" (see col.2, lines 20-25).

However Seki in combination do not teach inserting in time domain the amplitude modulated bit sequence.

Aslanis et al teaches a carrier transmission system for inserting in time domain the amplitude modulated bit sequence (see col.2, lines 16-35).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Aslanis into Seki combination as to maintain accurate frame synchronization during the operation.

As per claims 48, 51, 71, 74 Seki "389" does teach said multi-carrier modulated signal is an orthogonal frequency division multiplex signal (see abstract).

As per claims 49, 52, 72, 75 Seki "389" would include wherein said amplitude modulation is performed such that a mean amplitude of said reference symbol substantially corresponds to a mean amplitude of the remaining multi-carrier modulated signal as to correct the transmission frame according to the detected variations in amplitude and phase of the received signal as taught by Seki "224" (see col.2, lines 20-25).

As per claims 53, 76 Seki "389" does include wherein said bit sequence is a pseudo random (see col.5, lines 1-3) bit sequence having good autocorrelation (see fig.3 element 318) characteristics.

As per claims 54, 77 Seki "389", wherein a number of useful symbols in each frame is defined depending on channel properties of a channel through which the signal or the multi-carrier modulated signal is transmitted as to correct the transmission frame according to the detected variations in amplitude and phase of the received signal as taught by Seki "224" (see col.2, lines 20-25).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 55-60 and 78-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al U.S. Patent No 5,694,389 in view of Aslanis et al U.S. patent N0 6,359,993 B1

As per claims 55, 78 Seki teaches a method for frame synchronization of a signal having a frame structure, each frame of said frame structure comprising at least one useful symbol, a guard interval associated with said at least one useful symbol and a reference symbol, said method comprising the steps of: receiving said signal (see fig.5); down-converting said received signal (see fig.5 element 301); performing an amplitude-demodulation (see fig.5 element 303) of said down-converted signal in order to generate an envelope (see fig.5 element 314); correlating (see fig.5 element 318) said envelope (314) with a predetermined reference pattern in order to detect the signal reference pattern of said reference symbol in said signal; and performing said

frame synchronization (see fig.5 element 322 and col.4, lines 20-25) based on the detection of said signal reference pattern.

However Seki does not teach inserting in time domain the amplitude modulated bit sequence.

Aslanis et al teaches a carrier transmission system for inserting in time domain the amplitude modulated bit sequence (see col.2, lines 16-35).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Aslanis into Seki as to maintain accurate frame synchronization during the operation.

As per claims 56, 79 Seki teaches the step of performing an AFC automatic frequency control. Therefore the step of performing a fast automatic gain control of said received down-converted signal prior to the step of performing said amplitude-demodulation would have been performed by Seki in combination with Aslanis as to maintain accurate frame synchronization during the operation.

As per claims 57, 80 Seki teaches wherein the step of performing said amplitude demodulation comprises the step of calculating amplitude of said signal (see fig.5 element 314).

As per claims 58-59, 81-82 Seki teaches further comprising the steps of sampling (see fig.5 element 302) respective amplitudes of said received down-converted signal and comparing (see fig.5 element 315 and col.7, lines 8-15) said sampled amplitudes with a predetermined threshold in order to generate a bit sequence in order to perform said amplitude demodulation.

As per claims 60, 83 Seki teaches, further comprising the step of applying a result of the frame synchronization for a frame (see col.4, lines 20-29) in said signal to at least one subsequent frame in said signal.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 61-69 and 84-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al U.S. Patent No 5,646,935 in view of Seki et al U.S Patent No 5,694,389 and in further view of Aslanis et al U.S. patent No 6,359,933 B1.

As per claims 61, 84 Ishikawa et al teaches a method for frame synchronization of a multi-carrier modulated signal having frame structure, each frame of said frame structure comprising at least one useful symbol, a guard interval associated to said at least one useful symbol and a reference symbol, said method comprising the steps of: receiving said multi-carrier modulated signal (fig.3); a mixer is the same as the claimed (down-converting) (see fig.3 element 34) said received multi-carrier modulated signal; performing an amplitude-demodulation (see figs.11, 13 elements 801, 901 and col.4, line 8-20) of said down-converted multi-carrier modulated signal in order to generate an envelope (see fig.3 element 46); performing said frame synchronization (see col.3, lines 20-21) based on the detection of said signal reference pattern; extracting (see fig.3 element 47) said reference symbol and said at least one guard interval (see fig.3 element 49) from said down-converted received multi-carrier modulated signal based on said frame synchronization; performing a Fourier transform (see fig.3 element 51) in order to provide a sequence of spectra from said at least one useful symbol; de-mapping (see fig.3 element 59) said sequence of spectra in order to provide a bit stream.

However Ishikawa does not teach correlating said envelope with a predetermined reference pattern in order to detect the signal reference pattern of said reference symbol in said multi-carrier modulated signal.

Seki teaches correlating said envelope with a predetermined reference pattern in order to detect the signal reference pattern of said reference symbol in said multi-carrier modulated signal (see fig.5 element 318 and col.7, lines 23-35).

It would have obvious to one of ordinary skill in the art to implement the teaching of Seki into Ishikawa as to indicate a peak when the reception pattern matches with the transmission pattern as taught by Seki (see col.7, lines 25-27).

However Ishikawa and Seki in combination do not teach inserting in time domain the amplitude modulated bit sequence.

Aslanis et al teaches a carrier transmission system for inserting in time domain the amplitude modulated bit sequence (see col.2, lines 16-35).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Aslanis into Ishikawa and Seki combination as to maintain accurate frame synchronization during the operation.

As per claims 62, 85, Ishikawa does include the step of performing a fast automatic gain control (see fig.3 element AGC) of said received down-converted multi-carrier modulated signal prior to the step of performing said amplitude-demodulation.

As per claims 63, 86 Ishikawa does include the step of performing said amplitude demodulation comprises the step of calculating an amplitude (see fig.3 element 46) of said multi-carrier modulated signal.

As per claims 64-65, 87-88 Ishikawa does include the steps of sampling (see fig.3 element 44) respective amplitudes of said received down-converted multi-carrier modulated signal. Furthermore implanting a step of comparing said sampled amplitudes with a predetermined threshold in order to generate a bit sequence in order to perform said amplitude demodulation into Ishikawa would have been obvious to one skilled in the art as to indicate a peak when the reception pattern matches with the transmission pattern as taught by Seki (see col.7, lines 25-27).

As per claims 66, 89, Ishikawa does include the step of applying a result of the frame synchronization for a frame (see col.3, lines 20-25) in said signal to at least one subsequent frame in said multi-carrier modulated signal.

As per claims 67-68, 90-91, Ishikawa and Seki combination would include the step of detecting a location of said signal reference pattern based on an occurrence of a maximum of a correlation signal when correlating said envelope with said predetermined reference pattern as to indicate a peak when the reception pattern matches with the transmission pattern as taught by Seki (see col.7, lines 25-27).

As per claims 69, 92, Ishikawa and Seki combination would include the step of: disabling the step of performing said frame synchronization for a predetermined period of time after having switched-on a receiver performing said method for frame synchronization as to accurately retrieve the best reception signal.

*Conclusion*

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Liu et al U.S. Patent No 6,092,122 teaches an XDSL DMT modem.

Bae et al U.S. Patent No 5,832,387 teaches an adaptive power allocating method.

Sandberg et al U.S. patent No 5,631,610 teaches a single side-band modulation system.

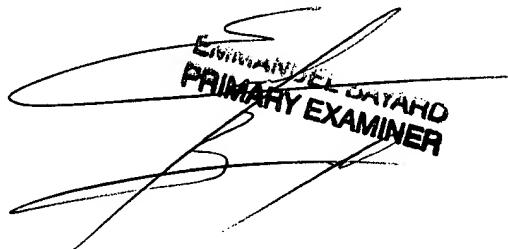
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 703 308-9573. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 703 306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Bayard  
Primary Examiner  
Art Unit 2631

8/21/04



A handwritten signature in black ink, appearing to read "Emmanuel Bayard". Overlaid on the signature is a printed, slanted text that reads "PRIMARY EXAMINER".